



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,115	08/08/2003	Haijun Yuan	AVA-P007	3827
7590	11/16/2004		EXAMINER	
Law Offices of Peter C. Su PO Box 878 Menlo Park, CA 94026-0878			VU, PHU	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/637,115	YUAN ET AL.
	Examiner	Art Unit
	Phu Vu	2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 08 August 2003.

2a) This action is **FINAL**.                                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-14 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-14 is/are rejected.

7) Claim(s) 8-10 is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5) Notice of Informal Patent Application (PTO-152)

6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Objections***

Claims 8, 9, and 10 are objected to because of the following informalities:

Claims 8 & 10 currently depends only on themselves. Claim 9 depends on claim 10. A claim can only depend on a preceding claim. Appropriate correction is required. For examining purposes they each will depend on the closest independent claim preceding it.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claim 2 discloses a “small beam collimator” but in the specification it is defined as providing minimal separation between the polarization states while maintaining a maximum extinction ratio of the polarization. There is does not provide enough information to adequately examine this claim therefore it will be treated as a collimator.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1, 4, 7 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Juday 6680797.**

**Regarding claim 1**, Juday teaches a spatial light modulator having a polarization beam splitter (cover figure element 10) having a first face and a second face for receiving a collimated beam and separating a beam into orthogonal polarization states. Juday also teaches a waveplate (cover figure element 12) coupled to the second face of the crystal for rotating the polarization beam by 90 degrees thereby causing the rotated beam to have the same polarization as the other polarization beam and a liquid crystal device for processing the beams. No patentable weight is given to S and P polarization because these are merely considered orthogonal polarization states and in the alternative this limitation is considered obvious of the reference. **Regarding claim 7**, this claim mirrors claim 1 in method form and introduces no additional structure or steps not anticipated by claim 1, therefore the rejection mirrors that of claim 1.

**Regarding claim 4**, it is considered inherent to match polarization orientation of a filter to that of the polarizer it is meant to operate with. In the alternative this limitation is obvious over the reference.

**Regarding claim 11**, dividing a beam into 2 linear orthogonal polarization states prior to sending it the half wave plate is inherent to dividing a beam into two orthogonal polarization states and in the alternative obvious over the reference.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juday 6680797.** Juday teaches all the limitation of claim 5, see rejection above except a photodiode for receiving the P-polarization beam and rotated S-polarization beam. However Juday does disclose an optical drain such as a photodetector (see column 3 lines 57-59). Therefore, at the time of the invention it would have been obvious to add a photo diode as a means capture the outgoing signal.

**Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juday as applied to claim 1 above, and further in view of Lee et al US Patent 6522467.** Juday teaches all the limitations of claim 6 except a bi-cell photodiode having a first cell and a second cell, the first cell for receiving the P polarization beam, the second cell of the bi-cell photodiode receiving the rated S-polarization beam. Lee discloses as prior art a LC tunable filter capable or filtering to input signals (see figure 1

element 26). Juday also discloses use of a photodetector as a means of capturing an output signal. Bi-cell photodetectors use is well known for capturing multiple input sources. It would be obvious to one of ordinary skill in the art to use a bi-cell photodetector having each polarization state going in order reduce processing required to demultiplex the signal. Therefore, at the time of the invention, it would have been obvious to combine Lee's LC tunable filter capable to Juday's invention in order to process multiple inputs separately and also add a bi-cell photo-detector to reduce the need for a means to de-multiplex the output signal.

**Claims 2, 8, 12, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juday as applied to claim 1 / 7 above respectively, and further in view of Chen US PreGrant Publication 2003/0103718.**

**Regarding claims 2, 8, and 12** Juday teaches all the limitations of claim 2 except a small beam collimator coupled to the first face of the polarizer, the small beam collimator receiving an input beam and collimating the input beam to become a collimated beam. Chen teaches a collimator coupled to a birefringent crystal having an input beam and emitting a collimated beam (see cover figure element 13). Claims 8 and 12 mirror claim 2 in a method form and lends no additional structure or steps not anticipated by claim 2 therefore the rejection mirrors claim 2. Regarding claim 3 this collimator is considered to have "minimal space separation" between the polarization states. It is well known in the art to collimate light prior to processing it to reduce

interference. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to add a collimator to collimate an input beam to reduce interference.

**Regarding claims 9 and 13**, Judy teaches all the limitations of the claim except matching the alignment of the LC filter in the direction of the liquid crystal. However, “matching” of the liquid crystal to the liquid crystal filter is met by definition as the liquid crystal is a part of the filter.

**Regarding claims 10 and 14**, Judy discloses all the limitations of the claim except applying a voltage to an LC tunable filter to affect the rotated first beam and second beam. However since LC cells are active devices they require voltage to operate therefore this limitation is inherent to the primary reference.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu Vu whose telephone number is (571)-272-1562. The examiner can normally be reached on 8AM-5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phu Vu  
Examiner  
AU 287



KENNETH PARKER  
PRIMARY EXAMINER